CHAPTER 17 - ELECTRONIC DRAWING SUBMITTALS

1.0   General Information

1.1   It is the intent of these guidelines to establish the minimum standards, which must be met in the submission of Computer-Aided Drawing (CAD) files and similar electronic data on all State of Kansas capital improvement projects. It is the intent of these standards to provide uniform methods of archiving and sharing electronic data between the various owner/state agencies and project architects ~~or~~ /engineers.

1.2   These standards are not meant to dictate the in-house methods or means by which each project architect/engineer creates construction documents or CAD files in the normal conduct of their business. They are intended to establish standards for CAD files at the time they are submitted to the Division of Facilities Management for retrieving and archiving purposes.

1.2.1   The project architect/engineer may choose to continue producing CAD files in their current method, and convert them to conform to these standards for each required submission.

1.2.2   The project architect/engineer may choose to also provide digital photographs or a video to indicate as-built conditions.

1.3   All of the following standards are mandatory, unless noted as "preferred". Preferred standards are not required to be met, but should be adhered to whenever possible.

1.4   The project architect/engineer is responsible for all consultants work.

1.5   Contact the Division of Facilities Management at 785-296-8899 for any clarification regarding these submittal requirements.

2.0   Submittal Requirements

2.1   All CAD files shall be submitted complying with the current United States National CAD Standard as published by the National Institute of Building Sciences. More information is available at http://www.nationalcadstandard.org.

2.2   CAD files shall be submitted in ".DWG" format

2.3   **Preferred**: Use the current release of AutoDesk AutoCAD software to create the submitted drawings. All CAD files shall be created using the same make and version of CAD software.

2.4   No ".DXF" format CAD files will be accepted.

2.5   All data in submitted CAD file(s) for new projects shall be in a vector format. Raster format data shall be permitted only for existing facilities, either as stand-alone files or as underlays for remodeling projects within existing facilities. Hybrid files (those using both vector and raster) shall be noted in the index file, "index.doc/xls", of submitted files.

2.6   Deliverables

2.6.1   CAD file(s) shall be delivered on CD/DVD, with no more than one project per CD/DVD.

2.6.2   All submitted CD/DVDs shall be in a format appropriate for IBM compatible computers.

2.6.3   **Preferred**: Conforming to the "ISO 9660" file system standard, but the "Joliet" file system is also acceptable.

2.6.4 CD/DVD media shall be of CD-R type. CD-RW media will **NOT** be accepted. As this media type is not compatible with many computer systems.

2.6.5 **Preferred**: Media shall be the 650MB/74Min size. Media sizes larger than 700MB/80Min will **NOT** be accepted, as they are not compatible with many computer systems.

2.6.6 The packet writing method of creating a CD/DVD, like Roxio's DirectCD shall **NOT** be used. This method is not compatible with many computer systems.

2.6.7 Create CD/DVD with a single closed record session, to eliminate modification of the CD/DVD.

2.7 File Naming Conventions

2.7.1 All CAD files shall be submitted using a file naming convention, which complies with the current National CAD Standard naming convention.

2.7.2 All submitted files shall conform to the 8.3 filename naming standards for IBM compatible computers. Long file names shall not be used.

2.8 File Compression

2.8.1 CAD file(s) submitted on CD/DVD must **NOT** be compressed.

2.9 Support Files

2.9.1 All other files, which may be required to create "ready-to-plot" drawings, shall be included with the drawing files.

2.9.2 Scanned photographic images shall be submitted in TIFF file format. Other scanned images shall be submitted in CALS Group IV format.

2.9.3 Submit the "Plot Style Table" file(s) needed to correctly plot included drawing files. If more then one "Plot Style Table" is submitted, note in the Plot file, "Plot.doc/xls", which plot uses which "Plot Style Table".

2.10 Documentation

2.10.1 Provide an electronic copy of the Microsoft Word/Excel file, with the file name "index.doc/xls", on the CD/DVD of the CAD document index including CAD file name(s), sheet number(s) and description(s) for each file submitted.

2.10.2 Provide an electronic copy of the Microsoft Word/Excel file, with the file name "layers.doc/xls", on the CD/DVD of drawing layer scheme(s) used; include layer number, layer name, layer description, layer color number and name, and plotter pen-to-color/shading assignments, as follows.

Layer			Drawing Color		Plotter Pen	
No.	Name	Description	No	Name	Width	Shading
1	A-WALL-FULL	Full-Height Walls	2	Red	.50	100%
2	A-WALL-PRHT	Partial-Height Walls	5	Magenta	.35	50%
3	A-WALL-MOVE	Movable partitions	1	Black	.25	100%

2.10.3 Provide an electronic copy of the Microsoft Word/Excel file, with the file name "plot.doc/xls", on the CD/DVD of additional information which may be required to create a "ready-to-plot" drawing sheet. Including plot scales, layers to be frozen/thawed or turned on/off for various plotted documents embodied in a single CAD file, as follows.

Filename: A1.dwg		Thawed/On/Layers for each sheet		
No.	Layer Name	A1	A2	A3
1.	A-WALL-FULL	X	X	X
2.	A-WALL-PRHT	X	X	
3.	A-FLOR	X		
4.	A-FURN		X	
5.	A-CLNG			X

2.10.4   Provide an electronic copy of the Microsoft Word file, with the file name "moreinfo.doc", on the CD/DVD of additional information which may be required to create a "ready-to-plot" drawing sheet; i.e., information about additional fonts required, raster image underlays, etc.

2.10.5   Include at the beginning of each of the above documents the following information: CAD program title and version used, project identification number, project title and project bid date, project architect/engineer's name(s), contact person(s), address(es) and phone number(s).

2.11   Volume Label

2.11.1   Each submitted CD/DVD shall have a unique electronic volume label created from the project identification number, minus the "A-", followed by a dash and a two digit sequential number representing the disk number in a series. A maximum of eleven characters may be used in a volume label, utilizing only uppercase characters.

2.11.2   Example: If the project identification number is "A-1234a" and the submitted CD-ROM is the second in a series then the volume label would be "1234A-02".

2.12   Media Labeling

2.12.1   CD/DVD's shall be labeled using an approved pressure sensitive label, similar to Avery 5824, or printed directly to surface. The following information shall be provided on the label: project identification number, project title bid date (for as-builts, use the project completion date), firm name, file format, and contents, such as final bid documents or as-builts.

2.12.2   If more than one CD/DVD is submitted, label the disk number of total number submitted (ex. "Disk 1 of 3"). The project number shall be printed on both the top and bottom halves of the label or CD/DVD surface and printed with a bold 12-point minimum font size.

2.12.3   Hand lettering directly onto CD/DVD with a permanent marker will **NOT** be accepted. A permanent marker may deteriorate the CD/DVD dye layer rendering them unusable.

2.13   Custom Menus

2.13.1   Submitted files shall **NOT** contain custom menus.

2.14   CAD File Content and Accuracy

2.14.1   Accuracy: Accepted professional standards shall be maintained in the production of all CAD contract documents.

2.14.2   Unused Entities: Before being submitted to DOAS, all CAD files shall be purged or packed of all unused entities, such as unused blocks (including nested blocks), symbols, layers and styles.

2.14.3   File shall be saved in a "Zoom All" Paper Space, "ready-to-plot", view of the same size as the submitted mylar or vellum documents.

2.15   Two Dimensional or Three Dimensional Features

2.15.1 All CAD files may be submitted in two dimensional (2D) or three dimensional (3D) file formats. Label all 3D files as such in the index file, "index.doc/xls", of submitted files.

2.16   CAD Fonts

2.16.1 Until the Division of Facilities Management adopts a CAD font standard for the State of Kansas projects, it is suggested that only CAD and TrueType fonts be used that are supplied with the CAD software or CAD and TrueType fonts be used which can be freely distributed. The project architect/engineer shall copy onto the CD-ROM all CAD and TrueType fonts required by the submitted drawings, but not supplied with the CAD software.

2.16.2 Project architect/engineers are encouraged **NOT** to use TrueType fonts within the submitted CAD files.

a. In the event the project architect/engineer chooses to use CAD or TrueType fonts which cannot be freely distributed, the project architect/engineer shall be responsible for the payment of all license or royalty fees for use of the copyrighted fonts. The project architect/engineer shall hold and save the owner/state agency, its officers, agents, consultants and employees harmless from any expense or liability of any nature or kind in any way related to the copyrighted fonts.

b. Any such license must cover all future uses of the CAD file, which requires the licensed CAD and TrueType font. This includes, but is not limited to State of Kansas agencies, and their consultants.

2.17   External Reference Files

a. All referenced files, which may be required to create "ready-to-plot" drawings shall be delivered bound or combined with the drawing file.

3.0   Electronic Plan Room

3.1   At the time this update is being published, the State of Kansas is exploring options available through the electronic plan room. There are several items common to all electronic plan room providers.

3.2   Use of an electronic plan room will have additional requirements over and beyond what DFM now requires for final bid documents. These additional requirements are outlined below, but should not be considered a complete list of the requirements.

3.2.1 When naming electronic documents, the title of each drawing shall include the sheet number followed by the sheet's title that matches the description in the drawing's title block. Common abbreviations as are acceptable for required brevity.

3.2.2 Electronic drawings should be saved in either a ".cal" or ".tif" format.

3.2.3 Electronic specifications should be saved in read only and searchable, ".pdf" format.

END OF CHAPTER 17